



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/533,169   | 04/17/2006  | Takeaki Saiki        | 71051-008           | 9218             |
| 27305 7590 04/07/2009<br>HOWARD & HOWARD ATTORNEYS PLLC<br>450 West Fourth Street<br>Royal Oak, MI 48067 |             |                      |                     |                  |
| EXAMINER   |             |                      |                     |                  |
| DOLLINGER, MICHAEL M   |             |                      |                     |                  |
| ART UNIT   |             | PAPER NUMBER         |                     |                  |
| 1796   |             |                      |                     |                  |
| MAIL DATE  |             | DELIVERY MODE        |                     |                  |
| 04/07/2009   |             | PAPER                |                     |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/533,169

**Applicant(s)**

SAIKI ET AL.

**Examiner**

MICHAEL DOLLINGER

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

#### ***Claim Objections***

1. Claim 4 is objected to because of the following informalities: there is a superfluous hyphen in line 6: "group with-1-15". Appropriate correction is required.
2. Claim 9 is objected to because of the following informalities: on the last line "(S<sub>y</sub>R<sup>3</sup>)in" should be "(S<sub>y</sub>R<sup>3</sup>) in". Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 5 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Regarding claims 5 and 9, the inclusion of a term within parentheses renders the claim indefinite because it is unclear whether the included term is part of the claimed invention.

#### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

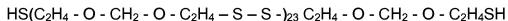
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Millen (US 3,476,826).

8. Millen discloses organosilane modified polysulfide polymers as adhesive additives for high rank polysulfide based adhesive composition [abstract].

9. An embodiment of the invention disclosed in Example 1 and the general disclosure of Millen anticipate claims 1-8 and 10. Example 1 of Millen discloses a method of preparing vinyl triethoxy silane polysulfide by mixing (A) vinyl triethoxy silane [column 5 lines 31-32], (B) a polysulfide polymer [column 5 lines 24-30] having essentially the structure



and (C) 2,2'-azobisisobutyronitrile [column 5 lines 34-35]. The reaction is carried out in a moisture-free (inert) atmosphere at 110°C [column 5 lines 32-34]. The polysulfide may be a high sulfur rank polysulfide [column 4 lines 33-34] which is formed by reacting a polysulfide polymer with elemental sulfur [column 4 lines 54-60].

10. The embodiments of the invention disclosed in Examples 3 and 4 anticipate claims 1-10. Examples 3 and 4 disclose a composition comprising a mixture of the resulting polymers of Examples 1 and 2 [column 5 lines 70-75; column 6 lines 52-60]. Example 1, described above, discloses a mixture of (A) 40 grams of vinyl triethoxysilane and (B) 200 grams of polysulfide polymer combined in a moisture free atmosphere and heated to 110°C [column 5 lines 20-35]. Example 2 of Millen discloses a process wherein the same polysulfide as Example 1 is combined with (C) 2cc. of n-dibutylamine [column 5 lines 55-56] and (D) 58 g of elemental sulfur [column 5 line 55]. This process

is carried out in a nitrogen atmosphere at a temperature of 23-53°C [column 5 lines 57-59]. Since the instant claims only require "mixing" of the elements, no particular order of adding the ingredients, specific combinations of ingredients or batch or continuous process is required by the claims. So long as each ingredient (A), (B), C() and (D) is at some point mixed with at least one other ingredient and a silicon-containing polysulfide-type polymer results, then all the claim limitations are met. When Examples 1 and 2 are combined in Examples 3 and 4, this reads on the claimed process.

11. Regarding claim 9, Examiner has calculated the claimed mole percents of Millen that are required by claim 9 and found that (B) is used in an amount of 23.8 mol% of (A), (C) is used in an amount of 5.6 mol % of (A), and (D) is used in an amount of 37.5 mol % of (S<sub>y</sub>R<sup>3</sup>) repeating units in (B).

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

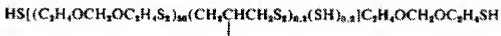
1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ely (US 3,925,331).

15. Ely discloses a moisture curable sealant composition which comprises the product of reacting under anhydrous conditions a polysulfide of the formula



with a silane of the formula  $\text{Q}_n\text{SiX}_{4-n}$  where n is 1 or 2, Q is an organic groups which may be  $\text{CH}_2=\text{CR}_{15}$  -  $\text{C}_m\text{H}_{2m}$  -, and at least 2 X are organic hydrolyzable groups and the remaining X (if any) is  $\text{C}_{1-6}$  alkyl or chloroalkyl [abstract]. When the Q group in the silane is of formula  $\text{CH}_2 = \text{CH}(\text{CH}_2)_m$  e.g. as in vinyl triethoxysilane or vinyl ethyl dimethoxy (or diethoxy) silane, 3-10% of the SH groups of polysulphides of molecular weight 4,000-10,000 can be reacted by heating for 8-25 hr at 80-120°C with an amount of silane in the molar ratio to thiol in the polysulphide of 0.5 : 1 to 1.5 : 1. Addition of 0.001-3% by weight of catalyst e.g. an amine such as pyridine or sulphur enhances the amount of addition under otherwise identical conditions [column 6 lines 4-13]. In Example 14, for instance, Ely discloses a process wherein (B) 0.05mol of a polymer of the formula



was mixed with 500ml toluene and the mixture was boiled under reflux to remove water [column 17 lines 35-42] to achieve an inert environment and to this solution was added (D) 2.5g of sulfur (0.078mol) and (A) 0.17mol of vinylmethyl dimethoxysilane [column 17 lines 42-45]. If pyridine was added as a catalyst as well, it would be included in an

amount of 0.001-3% by weight of the composition which corresponds to 0.05 to 15.8 g or pyridine equal to 0.00067 to 0.2mol pyridine.

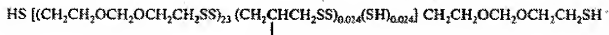
16. Ely does not disclose a process wherein both a nitrogen containing base and sulfur are mixed with claimed components (A) and (B). However, Ely does disclose that both pyridine (a nitrogen containing organic base) and sulfur may be used as catalysts for the reaction of (A) and (B) [column 6 lines 12-13].

17. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have prepared a silicon containing polysulfide type polymer by the process of mixing a vinyl silane, mercapto terminated polysulfide, nitrogen containing organic base and elemental sulfur because Ely teaches that it is within the skill of the art to prepare a silicon containing polysulfide type polymer by the process of mixing a vinyl silane, mercapto terminated polysulfide and Ely also teaches that it is within the skill of the art to catalyze the reaction with pyridine or elemental sulfur. One would have been motivated to use both elemental sulfur and pyridine as the catalyst because Ely teaches that they are functional equivalents for this purpose and it is *prima facie* obvious to combine two composition each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose. See *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA). Absent any evidence to the contrary, there would have been a reasonable expectation of success in mixing a vinyl silane, mercapto terminated polysulfide, nitrogen containing organic base and elemental sulfur.

18. Regarding claim 9, Examiner has calculated the claimed mole percents of Example 14 of Ely that are required by claim 9 and found that (B) is used in an amount of 29.4 mol% of (A), (C) is used in an amount of 0.4 to 117 mol % of (A), and (D) is used in an amount of 3.1 mol % of  $(S_yR^3)$  repeating units in (B). The disclosed range of mol% of (C) overlaps the claimed range of 0.01 to 10 mol%. In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 1911 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

19. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Price et al (US 4,096,131) in view of Ely (US 3,925,331).

20. In Example 9, Price et al disclose a process of forming a silyl containing polysulfide polymer by mixing (B) a polysulfide of the formula [column 13 line 1]



with (D) 25 g of sulphur and (A) 150 g of methylvinyl dimethoxysilane under an atmosphere of nitrogen and vacuum at 100°C [column 15 lines 39-45].

21. Price et al do not disclose a process wherein a nitrogen containing organic base is mixed with components (A), (B) and (D).

22. Ely, discussed above, discloses that both pyridine (a nitrogen containing organic base) and sulfur may be used as catalysts for the reaction of (A) and (B) [column 6 lines 12-13]. Ely teaches, henceforth, that pyridine and sulfur are functionally equivalent for



the purpose of catalyzing the reaction of (A) and (B). Ely also teaches that pyridine and sulfur should be included in 0.001 to 3% by weight [column 6 lines 12-13].

23. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have prepared a silicon containing polysulfide type polymer by the process of mixing a vinyl silane, mercapto terminated polysulfide, nitrogen containing organic base and elemental sulfur because Price et al teach that it is within the skill of the art to prepare a silicon containing polysulfide type polymer by the process of mixing a vinyl silane, mercapto terminated polysulfide and sulfur and Ely teaches that it is within the skill of the art to catalyze the reaction of a vinyl silane and a mercapto terminated polysulfide polymer with pyridine or elemental sulfur. One would have been motivated to use both elemental sulfur and pyridine as the catalyst in the process of Price et al because Ely teaches that they are functional equivalents for this purpose and it is *prima facie* obvious to combine two composition each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose. See *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA). Absent any evidence to the contrary, there would have been a reasonable expectation of success in mixing a vinyl silane, mercapto terminated polysulfide, nitrogen containing organic base and elemental sulfur.

24. Regarding claim 9, Examiner has calculated the claimed mole percents of Example 9 of Price et al that are required by claim 9 and found that (B) is used in an amount of 110 mol% of (A), (C) is used in an amount of 0.06 to 190 mol % of (A) (calculated based on the weight range of pyridine disclosed in Ely, discussed in

paragraph 22), and (D) is used in an amount of 2.7 mol % of (S<sub>y</sub>R<sup>3</sup>) repeating units in (B). The disclosed range of mol% of (C) overlaps the claimed range of 0.01 to 10 mol%. In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 1911 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

### ***Response to Arguments***

25. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL DOLLINGER whose telephone number is (571)270-5464. The examiner can normally be reached on Monday - Thursday 7:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Randy Gulakowski/  
Supervisory Patent Examiner, Art Unit 1796

MICHAEL DOLLINGER  
Examiner  
Art Unit 1796

/mmd/